

1. (Currently Amended) A cooling assembly comprising:  
an electronic package having a cavity;  
compliant interconnects secured on first ends to a surface of a substrate provided in the  
cavity;  
at least one die with active electronic components non-rigidly ~~mounted using lithographic on~~  
second ends of the compliant interconnects within the cavity; and  
at least one coolant port that allows a coolant to enter the cavity and directly cool the active  
electronic components of each die.
2. (Currently Amended) The cooling assembly of claim 1, wherein the ~~lithographic~~ compliant  
interconnects are coupled between each die and the package.
3. (Currently Amended) The cooling assembly of claim 2, wherein said ~~lithographic~~ compliant  
interconnects comprise spring contacts.
4. (Original) The cooling assembly of claim 3, wherein said spring contacts comprise wirebond  
springs.
5. (Previously Presented) A cooling assembly comprising:  
an electronic package having a cavity;  
at least one die with active electronics components mounted using compliant interconnects  
within the cavity; and  
at least one coolant port that allows a coolant to enter the cavity and directly cool the active  
electronic components of each die,  
wherein the compliant interconnects are coupled between each die and the package,  
wherein said compliant interconnects comprise spring contacts, and  
wherein said spring contacts comprise lithographic springs.

6. (Original) The cooling assembly of claim 5, wherein said lithographic springs comprise multipart lithographic springs.

7. (Previously Presented) A cooling assembly comprising:  
an electronic package having a cavity;  
at least one die with active electronic components mounted using compliant interconnects within the cavity; and  
at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronic components of each die,  
wherein the compliant interconnects are coupled between each die and the package, and  
wherein each die has at least one active surface, and when the coolant circulates in the cavity the coolant directly cools each active surface of each die.

8. (Previously Presented) A cooling assembly comprising:  
an electronic package having a cavity;  
at least one die with active electronic components mounted using compliant interconnects within the cavity; and  
at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronic components of each die,  
wherein the compliant interconnects are coupled between each die and the package, and  
wherein each die has a plurality of surfaces within the cavity including at least one active surface associated with respective active electronic components, and when the coolant circulates in the cavity the coolant directly cools each surface of each die, thereby reducing thermal gradients or hot spots on each active surface of each die and increasing the operating range of each die.

9. (Original) The cooling assembly of claim 2, wherein the at least one coolant port allows liquid coolant to enter and exit the package.
10. (Original) The cooling assembly of claim 2, wherein the at least one coolant port allows gas coolant to enter and exit the package.
11. (Original) The cooling assembly of claim 2, wherein the at least one coolant port allows a combination of liquid and gas coolants to enter and exit the package.
12. (Original) The cooling assembly of claim 2, wherein the at least one coolant port comprises a valve that allows the coolant to enter the package and surround each die.
13. (Original) The cooling assembly of claim 2, further comprising:  
a cooling system; and  
a coolant circulation system coupled between the cooling system and the at least one coolant port.
14. (Original) The cooling assembly of claim 2, wherein said package further comprises:  
bottom and top substrates coupled to one another by a seal to form a cavity enclosing each die.
15. (Original) The cooling assembly of claim 12, wherein the seal comprises an O-ring.
16. (Previously Presented) A cooling assembly comprising:  
an electronic package having a cavity;  
at least one die with active electronic components mounted using compliant interconnects within the cavity; and

at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronic components of each die,

wherein the compliant interconnects are coupled between each die and the package, and

wherein said package further comprises a bottom substrate on one side of the cavity, wherein each die with active electronic components is connected to the bottom substrate by the compliant interconnects, and wherein the active electronic components face the bottom substrate and contact coolant surrounding the compliant interconnects within the cavity.

17. (Original) The cooling assembly of claim 16, wherein said compliant interconnects comprise first and second sets of compliant interconnects and wherein said package further comprises a top substrate; and

further comprising alignment posts wherein the alignment posts are attached to the bottom substrate, the first set of compliant interconnects is coupled between each die and the bottom substrate, and the dies are further held in place by contact with the alignment posts and downward pressure from the second set of compliant interconnects.

18. (Currently Amended) The cooling assembly of claim 2, wherein said substrate ~~package~~ further comprises a bottom substrate having contacts, whereby external components can be electrically coupled to each die via the contacts.

19. (Currently Amended) The cooling assembly of claim 2, wherein said substrate ~~package~~ further comprises a bottom substrate having contacts arranged on an edge region of the bottom substrate, whereby external components can be electrically coupled to each die via the contacts.

20. (Previously Presented) A cooling assembly comprising:  
an electronic package having a cavity;

at least one die with active electronic components mounted using compliant interconnects within the cavity; and

at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronic components of each die,

wherein the compliant interconnects are coupled between each die and the package, and

wherein said package further comprises a top substrate with a top surface representing an exterior surface of the package and wherein the top surface includes contacts, whereby external components can be electrically coupled to each die via the contacts.

21. (Previously Presented) A cooling assembly comprising:

an electronic package having a cavity;

at least one die with active electronic components mounted using compliant interconnects within the cavity; and

at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronic components of each die,

wherein the compliant interconnects are coupled between each die and the package, and

wherein said package further comprises:

a top substrate;

a bottom substrate; and

interconnection elements that provide electrical paths extending through the top substrate and the bottom substrate.

22. (Original) The cooling assembly of claim 2, wherein said at least one coolant port allows a coolant to enter the cavity in a liquid form and exit the cavity in a gas form to directly cool the active electronic components of the dies, and wherein said coolant has a boiling point at or near an operating temperature of each die.

23. (Previously Presented) A cooling assembly comprising;  
an electronic package having a cavity; and  
at least one die with active electronic components mounted using compliant interconnects within the cavity;  
at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronic components of each die,  
wherein the compliant interconnects are coupled between each die and the package;  
and  
a coolant circulation system coupled to said at least one coolant port, wherein the coolant circulates within the package and directly contacts all surfaces of each die to directly cool active electronic components during their operation.
24. (Previously Presented) A cooling assembly comprising:  
an electronic package having a cavity;  
at least one die with active electronic components mounted using compliant interconnects within the cavity; and  
at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronic components of each die,  
wherein the compliant interconnects are coupled between each die and the package;  
a cooling member; and  
one or more heat radiators, wherein each die is immersed in the coolant and each heat radiator transfers heat generated by each die from the coolant to said cooling member.
25. (Previously Presented) A cooling assembly comprising;  
an electronic package having a cavity;  
at least one die with active electronic components mounted using compliant interconnects within the cavity; and

at least one coolant port that allows a coolant to enter the cavity and directly cool the active electronics components of each die,

wherein the compliant interconnects are coupled between each die and the package;  
and

at least one non-contacting compliant interconnect coupled to a surface of said at least one die, whereby, heat can be further directed away from the surface of a die.

26. (Previously Presented) A cooling assembly comprising:

an electronic package having a cavity;

at least one die with active electronic components mounted using compliant interconnects within the cavity; and

at least one coolant port that allows a coolant to enter the cavity and directly cool the electronic components of each die,

wherein the compliant interconnects are coupled between each die and the package,  
and

wherein said package further comprises:

a top substrate; and

a bottom substrate,

wherein each die is flip-chip bonded to said top substrate.

27. (Currently Amended) A method for direct cooling of active electronic components, comprising:

coupling active electronic components through ~~lithographic~~ multi-layer compliant interconnects to a substrate of a package such that the active electronic components face the substrate, and such that the active electronic components are non-rigidly coupled to the multi-layer compliant interconnects;

sealing the attached active electronic components and multi-layer compliant interconnects within a cavity of the package; and

circulating coolant through the package cavity to directly contact the active electronic components.

28. (Currently Amended) A cooling assembly, comprising:

means for sealing at least one die with active electronic components in a package the die non-rigidly mounted within this package using ~~lithographic~~ compliant interconnects; and

means for circulating coolant through the package during operation of the active electronic components to reduce thermal variations across each die.

29. (Currently Amended) A cooling assembly comprising:

an electronic package having a cavity;

compliant interconnects provided within the cavity;

at least one die mounted using a first number of the compliant interconnects within the cavity, a second number of the compliant interconnects not contacting the die, the second number serving as heat sinks ~~including non-contacting compliant interconnects;~~ and

at least one coolant port that allows a coolant to enter the cavity and directly cool the at least one die.

30. (Cancelled)

31. (Currently Amended) A cooling assembly comprising:

an electronic package having a top substrate, a bottom substrate and a cavity between the top and bottom substrates, the substrates coupled to each other using compliant interconnects located within the cavity;



at least one die within the cavity electrically connected through ~~and bonded to~~ the top substrate and the compliant interconnects to a surface of the bottom substrate external to the cavity; and

at least one coolant port that allows a coolant to enter the cavity and directly cool the at least one die.